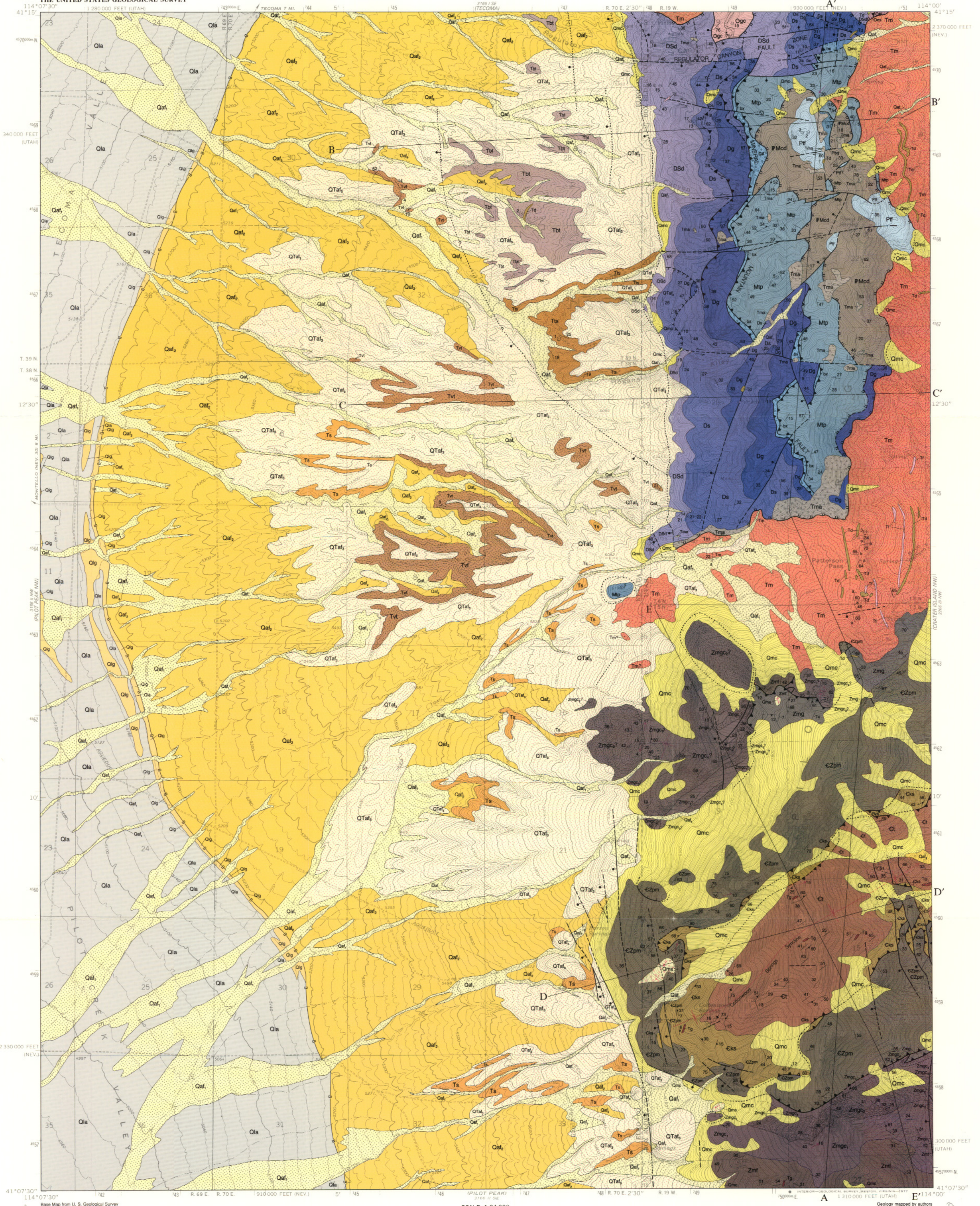
UTAH GEOLOGICAL SURVEY
UTAH DEPARTMENT OF NATURAL RESOURCES
in cooperation with
THE UNITED STATES GEOLOGICAL SURVEY

Plate 1
Utah Geological Survey Map 144

Geologic Map of the Patterson Pass Quadrangle



Base Map from U. S. Geological Survey
Patterson Pass 7.5' Quadrangle, 1967

SCALE 1:24 000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1992 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

GN MN
1° 52'
33 mils
15° 01'
267 MILS

NEVADA UTAH
QUADRANGLE LOCATION

GEOLOGIC MAP OF THE PATTERSON PASS QUADRANGLE, BOX ELDER COUNTY, UTAH, AND ELKO COUNTY, NEVADA

by

David M. Miller, Andrew P. Lush, and Joel D. Schneyer

1993

Geology mapped by authors
1979 - 81, 1988; assisted
by M. A. Pernokas, 1980
Lori J. Douglas, Cartographer

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Plate 2
Utah Geological Survey Map 144
Geologic Map of the Patterson Pass Quadrangle

DESCRIPTION OF MAP UNITS

Qms Landslide deposits (Holocene and Pleistocene)—*Displaced deposits of disaggregated rock and alluvium that form hummocky terranes. Huge detached masses of bedrock are mapped as gravity-slide blocks, identified by bedrock unit symbols.*

Qmc Colluvium and talus (Holocene and Pleistocene)—*Unconsolidated, blocky deposits on talus slopes and conglomerate, gravel, and sand slope-wash deposits.*

Qaf_1 Alluvial-fan deposits (Holocene and Pleistocene)—*Unconsolidated stream and fan deposits of poorly sorted gravel, sand, and silt. Deposited as alluvial cones at mouths of canyons and gullies, as alluvial floodplains bordering streams, and as sediments in stream channels. Slopewash included locally.*

Qla Lacustrine and alluvial deposits, undivided (Holocene and Pleistocene)—*Varied, complexly interlayered deposits of lacustrine and alluvial origins. In most places, unit consists of thin sheets of alluvium on erratically exposed lacustrine deposits.*

Qlg Lacustrine gravel (Pleistocene)—*Moderately to well-sorted pebble, cobble, and sand deposits, with sand and silt matrix.*

Qaf_2 Older alluvial-fan deposits (Pleistocene)—*Unconsolidated, poorly sorted gravel and sand forming piedmont flanking Pilot Range. Mostly stream and fan deposits; slopewash included locally. Overlain by deposits of Lake Bonneville.*

$QTaf_3$ Oldest alluvial-fan deposits (Pleistocene and Pliocene?)—*Unconsolidated to partly consolidated, poorly sorted boulder, cobble, pebble, gravel, sand, and silt alluvial deposits forming terraces. Locally contains extensive pedogenic calcite.*

Td Diabase (Pliocene?)—*Undivided reddish-brown, resistant diabase dikes and large nonresistant bodies that weather to soft, loose brown soils. Generally fine-grained, hornblende-plagioclase diabase and pyroxene-plagioclase mafic rock. Diabase intrudes faults cutting Miocene strata.*

Ts Sedimentary rocks (Miocene)—*Lithified, but generally nonresistant, green and brown fanglomerate; siliceous lake deposits such as conglomerate, sandstone, and siltstone; limestone. Thin interbeds of white, altered, water-laid vitric tuff included. Lake deposits generally thin bedded and fine grained.*

Tvt Vitric tuff (Miocene)—*White to light-gray, thin- to thick-bedded, vitric tuff containing no phenocrysts. Grading, cross-stratification, and interbedding of silt and sand suggest subaqueous deposition.*

Tf Felsite (Oligocene?)—*Light-gray felsite containing sparse phenocrysts of subhedral quartz, plagioclase, and alkali feldspar in an aphanitic, pale-gray groundmass. Most outcrops are of north-striking, steeply dipping dikes.*

Tts Tuff and sedimentary rocks (Oligocene? and Eocene)—*Poorly exposed, interbedded rhyolite and dacite tuff and varied sedimentary rocks, including conglomerate, sandstone, siltstone, lacustrine marl, and alluvium.*

Tbt Biotite rhyolite tuff (Oligocene? and Eocene)—*Poorly exposed, deeply weathered, biotite-alkali feldspar-plagioclase-quartz unwelded ash-flow(?) tuff, tuff breccia, and conglomerate. Minor welded tuff and air-fall tuff containing pumice clasts also present. Grades upward and laterally into tuff and sedimentary rocks unit (Tts).*

Tm McGinty Monzogranite (Eocene)—*Coarse-grained, white to gray, porphyritic monzogranite to granodiorite. Phenocrysts of alkali feldspar, as large as 5 cm (2 in) maximum diameter, set in coarse-grained matrix of plagioclase, alkali feldspar, quartz, and biotite. Biotite, generally 6-9% modally, is partially altered to chlorite. Age is latest Eocene. Locally, includes:*

Tma *Altered part— Fine-grained, yellow, tan, green, and brown siliceous rock containing quartz, feldspar, and calc- silicate minerals. Forms irregularly shaped bodies at intrusive contacts of main part of the McGinty Monzogranite and as pods within carbonate strata.*

Tg Granodiorite dikes (Eocene)—*Light-gray, medium-grained, hornblende-biotite-granodiorite with aphanitic to fine-grained matrix. Dikes vary in composition but are generally granodiorite.*

Pbg Badger Gulch Formation (Permian)—*Laminated to thin-bedded, platy, dark-gray to black, silty limestone; less common laminae and thin beds of siltstone are browner than limestone. Some beds bioclastic, typically containing crinoid fragments, spirifer brachiopods, and fusulinids.*

Ptf Third Fork(?) Formation (Permian)—*Gray and brown, slope-forming, calcareous, platy sandstone and arkose, and silty limestone.*

IPMcd Chainman Shale and Diamond Peak Formation, undivided (Pennsylvanian and Mississippian)—*Dark-gray shale, and dark-gray, dark-brown, and black sandstone and conglomerate with quartz, chert, and feldspar clasts. Moderately well bedded in medium to thick beds; conglomerate beds are 0.5 to 2 m (1.5 to 6 ft) thick and form cliffs.*

Mtp Tripon Pass Limestone (Mississippian)—*Platy, dark-gray to black, regularly bedded, silty limestone with subordinate interbeds of calcareous siltstone. Weathers light-gray with a pinkish hue.*

bx Silicified breccia—*Dense, resistant, dark-brown, brecciated jasperoid, silicified sandstone, altered carbonate rock, and siliceous vein and vug fillings. Lies on limestone of the Guilmette Formation (Dg) and probably represents replacement of the upper sandstone part of the Guilmette.*

Dg Guilmette Formation (Devonian)—*Light-gray-weathering, dark-gray, blue-gray, and black, cliff-forming limestone. Well-bedded or laminated throughout and fossiliferous. Sedimentary breccia and soft-sediment slump features common. Lower part contains common stringers and beds of dolomite. As mapped, locally includes (within uppermost part of unit) strata referred to as the Joanna Limestone.*

Ds Simonson Dolomite (Devonian)-*Interlayered dark- to medium-gray and light-gray calcareous dolomite forming steep slopes with distinctive light-dark banding. Medium to thick beds in lower part alternate in color; beds are uniformly dark or light in middle and upper parts. Characterized by fine laminations in all but a few beds.*

DSd Thick-bedded dolomite (Devonian and Silurian)—*Off-white, light- and medium-gray, faintly bedded to structureless dolomite and calcareous dolomite. Upper part is light-colored throughout, and locally contains quartz sand beds. Middle part is medium-gray and crinoid-bearing, with some layers of light- and dark-gray. Lower part is light gray and contains sparse chert nodules.*

Oes Ely Springs Dolomite (Ordovician)—*Medium-gray to black, poorly bedded, fractured calcareous dolomite.*

Oe Eureka Quartzite (Ordovician)—*Fractured, white and light-gray orthoquartzite. Well-size-sorted and well-rounded, medium quartz sand grains are indented by pressure solution, and in places are partly recrystallized.*

Ogc Garden City Formation (Ordovician)—*Thinly interbedded blue-gray limestone, gray and brown silty limestone, and brown calcareous siltstone. Quartzite unit indicated by dotted pattern.*

€t Toano Limestone (Cambrian)—*Gray to tan, platy, laminated and thin-bedded limestone and phyllitic limestone with dolomite and siltstone partings. Lower part is dark gray, silt-rich, and gradational into the underlying Killian Springs Formation (€ks).*

€ks Killian Springs Formation (Cambrian)—*Dark-colored, graphitic phyllite forming a gentle to moderate slope. Lower part is bench-forming homogeneous dark-gray, black, and dark-blue-gray, graphitic phyllite and siltstone, and upper part is dark-gray calcareous phyllite. Calcite content increases upward in upper part.*

€Zpm Prospect Mountain Quartzite (Cambrian and Late Proterozoic)— *Light-colored, prominently bedded, and cross-laminated quartzite forming massive cliffs.*

McCoy Creek Group of Misch and Hazzard (1962) (Late Proterozoic)—*Alternating phyllite and quartzite units. In this area, consists of Unit G—Divided into:*

Zmg Upper subunit —*Dark phyllite and metasiltstone with interbedded marble and quartzite.*

Conglomerate subunit—Divided into:

$Zmgc_4$ Interval 4 — *Dark-gray to black conglomerate and coarse-grained quartzite.*

$Zmgc_3$ Interval 3 — *Dark brown, rhythmically bedded phyllite and metasiltstone forming gentle slopes.*

$Zmgc_2$ Interval 2 —*Light-gray, coarse-grained to conglomeratic quartzite forming steep cliffs. Generally medium- to thick-bedded and cross-laminated, brown weathering, and micaceous.*

$Zmgc_1$ Interval 1 —*Dark-brown, quartzose phyllite with interbeds of coarse quartzite and conglomerate. Quartzite is dark-gray, brown, and light- gray, impure and poorly size-sorted. Conglomerate is polymict and contains phyllite rip-up wedges. Forms slopes with small cliffs.*

Zmf Unit F —*Gray, well-bedded and cross-laminated, cliff-forming quartzite. Lenticular conglomerate at top contains rip-up clasts of phyllite, boulders and cobbles of quartzite, and rare jasperoid clasts.*

UNITS PRESENT ONLY IN CROSS SECTION

McCoy Creek Group (Late Proterozoic)—*Divided into:*

Zme Unit E—*Brown quartzose schist and metasiltstone.*

Zmd Unit D —*Massive pebbly to granular quartzite.*

Zmc Unit C —*Tan metasiltstone.*

Zmb Unit B (?)—*Light-colored massive to laminated marble.*

Zma Unit A (?)—*Flaggy quartzite and mica schist capped by green amphibole schist.*

CONTACT - Dotted where covered

HIGH ANGLE FAULT - Dashed where location inferred, dotted where concealed; dip indicated; bar and ball on down thrown side

STRIKE SLIP FAULT - Dashed where location inferred; arrows show sense of separation and, on cross section, **A** is away from viewer, **T** is toward viewer

BEDDING PLANE FAULT - Dashed where inferred; barbs on hanging wall, dip indicated

LOW ANGLE NORMAL FAULT- Dashed where inferred; barbs on hanging wall

GRAVITY SLIDE BLOCK - dotted where concealed

ORIENTATION OF BEDDING

Inclined

Vertical

Overturned

ORIENTATION OF FOLIATION

Inclined

Vertical

ORIENTATION OF FOLIATION AND BEDDING AT SAME OUTCROP

LINEATION - Showing trend and plunge

MINOR FOLD - Showing trend and plunge of axis

TRACE OF AXIAL SURFACE OF ANTICLINE - Showing plunge

TRACE OF AXIAL SURFACE OF SYNCLINE - Showing plunge

STRIKE AND DIP OF IGNEOUS FEATURES - a, aplite; k, layer of alkali feldspar phenocrysts

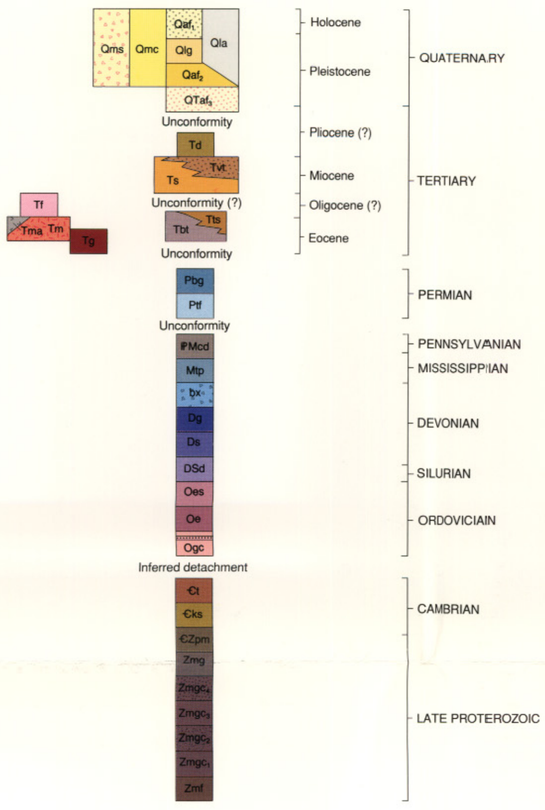
DRILL HOLE - Approximate location reported by Doelling (1980, p.89)

LOCATION OF PALEONTOLOGY SAMPLE

LOCATION OF GEOCHRONOLOGY SAMPLE

BONNEVILLE SHORELINE

CORRELATION OF MAP UNITS



Formation	Symbol	Thickness feet (meters)	Lithology
Vitric tuff	Tvt	2,300 (700)	
Sedimentary rocks	Ts	1,300 (400)	
Tuff and sedimentary rocks	Tts	2,300 (700)	
Biotite rhyolite tuff	Tbt	1,650 (500)	
Badger Gulch Formation	Pbg	260 (80)	
Third Fork (?) Formation	Ptf	720 (220)	
Chainman Shale and Diamond Peak	IPMcd	600 (185)	
Tripon Pass Limestone	Mtp	1,400 (425)	
Silicified breccia	bx	130 (40)	
Guilmette Formation	Dg	1,280 (390)	
Simonson Dolomite	Ds	1,200 (365)	
Thick-bedded dolomite	DSd	1,640 (500)	
Ely Springs Dolomite	Oes	390 (110)	
Eureka Quartzite	Oe	260 (80)	
Garden City Formation	Ogc	885 (270)	
Toano Limestone	€t	1,970 (600)	
Killian Springs Formation	€ks	990 (300)	
Prospect Mountain Quartzite	€Zpm	2,840 (865)	
McCoy Creek Group, Unit G, upper subunit	Zmg	1,725 (525)	
Conglomerate subunit, interval 4	$Zmgc_4$	65 (20)	
Conglomerate subunit, interval 3	$Zmgc_3$	165 (50)	
Conglomerate subunit, interval 2	$Zmgc_2$	475 (145)	
Conglomerate subunit, interval 1	$Zmgc_1$	1,310 (400)	
Unit F	Zmf	1,400 (425)